

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Fatollah Youssefifar

Serial No.: To be assigned

Filed: Herewith

For: PIPE COUPLINGS

Art Unit: To be assigned

Examiner: To be assigned

Atty Docket: 20272/0700



**SUBMISSION OF CERTIFIED PRIORITY DOCUMENT(S) and
CLAIM TO PRIORITY UNDER 35 U.S.C. § 119**

Commissioner for Patents
Washington, D.C. 20231

Sir:

Priority under 35 U.S.C. § 119 is hereby claimed to the following priority document(s), certified copies of which are enclosed. The documents were filed in a foreign country within the proper statutory period prior to the filing of the above-referenced United States patent application.

Priority Document Serial No.

Country

Filing Date

0101927.2

UK

January 23, 2001

0114055.7

UK

June 9, 2001

Acknowledgement of this claim and submission in the next official communication is respectfully requested.

Respectfully submitted,

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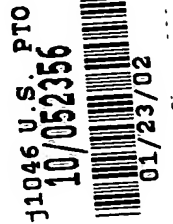
Date: 1-23-02

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11-13-02



INVESTOR IN PEOPLE

The Patent Office
Concept House
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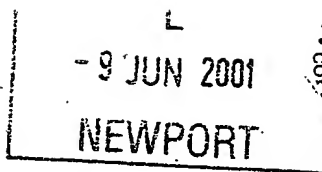
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Dated 7 January 2002



11JUN01 E635972-1 C26047
P01/7700 0.00-0114055.7

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Cardiff Road
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NP10 8QQ

1. Your reference

0100330

2. Patent application number

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09 JUN 2001

0114055.7

3. Full name, address and postcode of the or of each applicant (underline all surnames)

SMITHS GROUP PLC
765 FINCHLEY ROAD
LONDON
NW11 8DS

Patents ADP number (if you know it)

725705002

If the applicant is a corporate body, give the country/state of its incorporation

GB

08032310001

4. Title of the invention

PIPE COUPLINGS

5. Name of your agent (if you have one)

J. M. FLINT

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

765 FINCHLEY ROAD
LONDON
NW11 8DS

Patents ADP number (if you know it)

1063288002

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)

Date of filing
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7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
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See note (d))

9. Enter the number of sheets for any of the following items you are filing with this form.
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Description 5

Claim(s) one

Abstract

Drawing(s) 2+2

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Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11.

I/We request the grant of a patent on the basis of this application.

Signature

J. Flint

Date

08/06/01

12. Name and daytime telephone number of person to contact in the United Kingdom

J. M. FLINT

020 8457 8220

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PIPE COUPLINGS

This invention relates to pipe couplings and assemblies.

Connection to a corrugated pipe or conduit can be made by means of a coupling in which the end of the pipe is inserted, the coupling having a locking member in the form of a resilient tooth that engages between corrugations to prevent the pipe and coupling being pulled apart after assembly. The coupling may have a tapering bore forming a close fit with the outside of the pipe so as to seal the pipe with the coupling. Couplings of this kind are described, for example, in US5094482, US5041256, GB2225550, US5150930 and US4923227 and are sold by Adaptaflex Limited of Coleshill, Birmingham, UK. Although the seal provided by these couplings is satisfactory in many situations, there are some applications where a more effective seal is needed.

It is an object of the present invention to provide an alternative pipe coupling and assembly.

According to one aspect of the present invention there is provided a coupling for a pipe, the coupling including a housing and retaining means for retaining the pipe within the housing, the housing having a bore extending therethrough, the coupling being of a relatively rigid plastics material and having a layer of a relatively deformable material moulded onto at least a part of both its inner and outer surfaces.

According to a further aspect of the present invention there is provided an assembly of a coupling and a pipe, the coupling including a housing and retaining means retaining the pipe within the housing, the housing having a bore extending therethrough in which the pipe extends, the coupling being of a relatively rigid plastics material and having a layer of a relatively deformable material moulded onto at least a part of both its inner and outer surfaces.

The relatively deformable layer is preferably an elastomeric material. The layer on the inner and outer surfaces is preferably continuous. The retaining means may be formed integrally with the housing.

A coupling and an assembly of the coupling on a conduit according to the present invention, will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a side elevation view of the assembly of coupling and conduit; and

Figure 2 is a sectional side elevation view of the coupling.

With reference first to Figures 1 and 2, the assembly comprises a conduit 1 and a coupling 2 fitted on the forward, left-hand end 10 of the conduit.

The conduit 1 is entirely conventional and is of a rigid but bendable plastics material with a circular section and has corrugations 11 on its external and internal surfaces. The left-hand end 10 of the conduit 1 is cut square.

The coupling 2 comprises two parts joined with one another, namely a body or housing 20 and a layer 21. The housing 20 is similar to previous housings, being a single-piece moulding of a rigid plastics material of substantially tubular shape. The housing 20 has a bore 22 extending axially along its length and divided by a shoulder 23 into two portions, namely an entrance portion 24 and an exit portion 25. The entrance portion 24 at the right-hand end of the housing 20 receives the end of the conduit 1 and tapers slightly along its length. The exit portion 25 has a reduced constant diameter. Towards its right-hand end, the housing 20 is formed with retaining means in the form of two locking arms or catches 27 and 28 each having an inwardly-extending tooth 29 at its free, left-hand end. The coupling could have any number of one or more locking arms. The right-hand end of each arm 27 and 28 is attached integrally with the housing 20 by a hinge portion 30 of reduced thickness, which enables the arms to be flexed resiliently outwardly. The natural position of the locking arms 27 and 28 is extending slightly inwardly, as shown in Figure 2. The forward, left-hand end of the housing 20 has an external screw thread 33 by which the coupling 2 can be screwed into a cooperating female coupling (not shown). Instead of a screw thread, the housing could have other forms of fixing formation, such as barbs or spring catches. Externally, the housing 20 has a forwardly-facing face or ledge 40 at the location of the inner shoulder 23.

The layer 21 is of a deformable, resilient thermoplastics material, preferably an elastomer. The layer 21 covers the entire tapered inner surface of the entrance portion 24, the right-hand end face 41 of the housing 20 and parts of the outer surface of the housing.

That part of the layer 21 on the inside of the housing 20 provides an elastomeric seal 42 with the outside of the conduit 1. The dimensions of the housing 20, angle of taper and thickness of the layer 21 are such that the effective diameter of the bore 22 at the right-hand end is slightly greater than the external diameter of the conduit 1 and, at its left-hand end, is slightly smaller than the external diameter of the conduit. This arrangement is such that the end 10 of the conduit 1 can be pushed into the entrance portion 24 of the bore 22 but is prevented by contact with inside of the coupling from contacting the shoulder 23. In this way, the seal 42 is compressed slightly into a tight sealing contact with the outside of the conduit at its forward end 10.

An outer region 43 on one side of the housing 20 towards its left-hand end is covered by the layer 21 and is of a generally tulip shape. There is a corresponding region on the opposite side of the housing. These parts of the layer 21 provide manual gripping regions 43 to enable the coupling to be held more securely by the hand. The layer 21 also provides an annular flange 44 on the external ledge 40, the flange and tulip-shape area 43 being continuous with one another via a stem portion 45. The flange 44 provides a washer or seal with the end of a cooperating coupling (not shown) screwed onto the threaded portion 33. Alternatively, the flange 44 may seal against the face of a panel around an opening through which the coupling extends. This flange portion 44 can be omitted or provided by a separate component.

Preferably, the layer 21 is formed using a two-shot injection moulding process so that the seal is formed by the same machine that moulds the housing. The elastomeric material can be injected into the mould from the right-hand end of the housing so that it flows over both the inner surface and over the outer regions 43 and 45 into the flange portion 44, as one continuous layer. It will be appreciated, however, that the inner and outer layers could be moulded separately. Because the seal part 42 is moulded into the housing 20, it is securely bonded with it and forms an effective seal with the inside of the housing.

In use, the coupling 2 is provided as a single component. The user simply pushes the forward end 10 of the conduit 1 into the rear end of the housing 20, so that the teeth 29 on the locking arms 27 and 28 ride over corrugations 11 on the conduit. The forward end 10 of the conduit 1 deforms the seal 42 outwardly slightly as it is pushed into the entrance portion 24. Rearward movement of the conduit 1 is prevented by the locking arms 27 and 28, which engage the conduit more tightly as force is applied to separate the conduit and coupling. The conduit 1 holds the material of the seal 21 compressed between the outside of the conduit and the inside of the housing 20 to provide an effective seal.

This arrangement enables both an effective seal and external gripping regions to be provided without the need for separate components or separate assembly operations.

It will be appreciated that the invention is not limited to use with conduits but could be used on other forms of pipe. Alternative locking means could be used, such as with uncorrugated pipes.

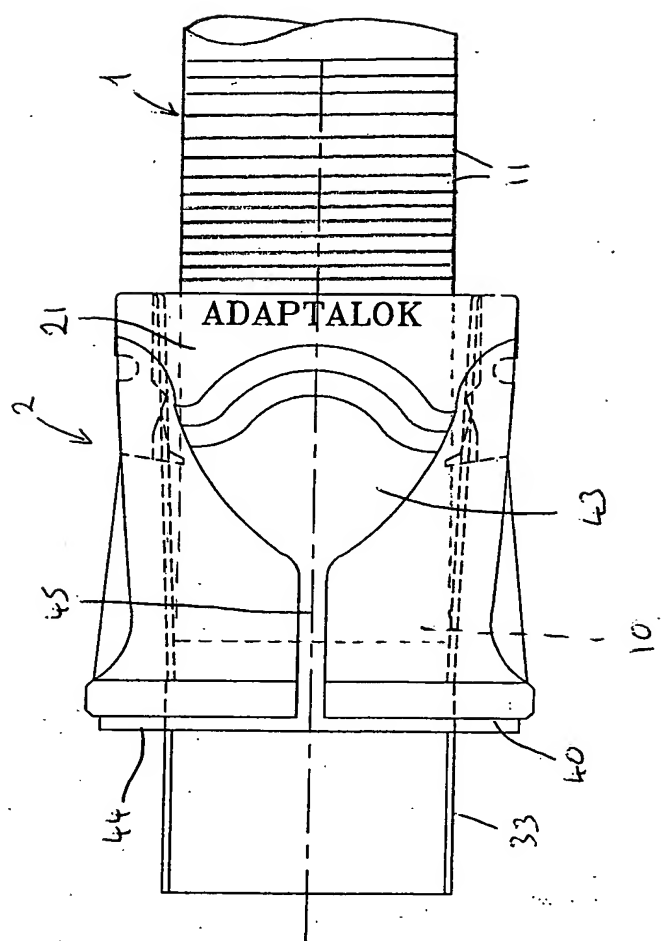


FIG. 1

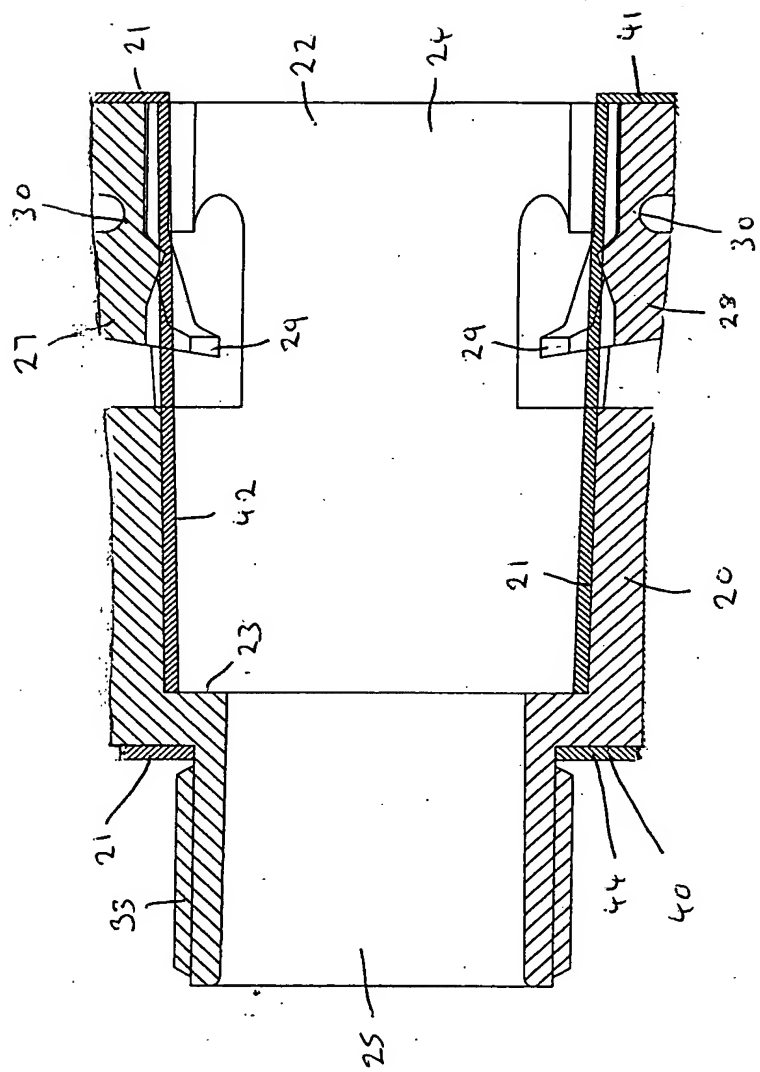


FIG. 2